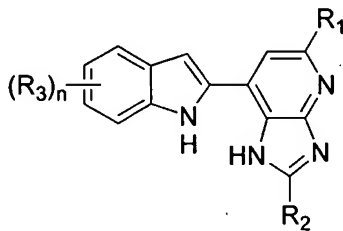


## CLAIMS

What is claimed is:

1. A method for treating or lessening the severity of reperfusion injuries, osteoporosis and/or bone metastasis comprising:

administering to a subject in need thereof a therapeutically effective amount of a compound having the structure (I):



(I)

or pharmaceutically acceptable derivative thereof;

wherein n is an integer from 0-4;

R<sub>1</sub> is hydrogen, -NH<sub>2</sub>, -NHMe, -NHAc, -OH, F, -OMe, -CN, or -NH(C=O)OEt;

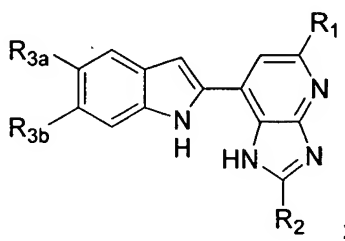
R<sub>2</sub> is hydrogen, -NR<sub>A</sub>R<sub>B</sub>, -OR<sub>A</sub>, an aliphatic, heteroaliphatic, aryl, or heteroaryl moiety, wherein R<sub>A</sub> and R<sub>B</sub> are each independently hydrogen or an aliphatic, heteroaliphatic, aryl or heteroaryl moiety;

each occurrence of R<sub>3</sub> is independently hydrogen, halogen, cyano, or an aliphatic, heteroaliphatic, aryl or heteroaryl moiety, or a group -G-R<sub>C</sub>, wherein G is absent or is -CH<sub>2</sub>-, -NR<sub>D</sub>-, -O-, or (C=O), and wherein R<sub>C</sub> is hydrogen, -NR<sub>F</sub>R<sub>G</sub>, -OR<sub>F</sub>, -SR<sub>F</sub>, or an aliphatic, heteroaliphatic, aryl, or heteroaryl moiety, wherein R<sub>D</sub>, R<sub>F</sub> and R<sub>G</sub> are each independently hydrogen, -NR<sub>x</sub>R<sub>y</sub>, an aliphatic, cycloaliphatic, heteroaliphatic, cycloheteroaliphatic, aryl, or heteroaryl moiety, an acyl moiety substituted with an aliphatic, heteroaliphatic, aryl or heteroaryl moiety, or wherein R<sub>D</sub> and R<sub>C</sub> or R<sub>F</sub> and R<sub>G</sub> taken together are a 3-, 4-, 5-, 6-, 7- or 8-membered substituted or unsubstituted cycloaliphatic or cycloheteroaliphatic moiety; wherein each occurrence of R<sub>x</sub> and R<sub>y</sub> is independently hydrogen, an aliphatic, cycloaliphatic, heteroaliphatic, cycloheteroaliphatic, aryl, or heteroaryl moiety, an acyl moiety substituted with an aliphatic, heteroaliphatic, aryl or heteroaryl moiety, or wherein R<sub>x</sub> and R<sub>y</sub> taken together are a 4-, 5- or 6-

membered substituted or unsubstituted, saturated or unsaturated cycloaliphatic or cycloheteroaliphatic moiety; and

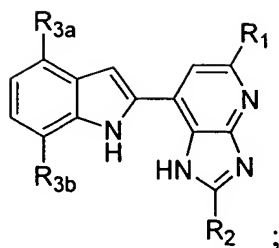
a pharmaceutically acceptable carrier or diluent; and optionally further comprising administering an additional therapeutic agent.

2. The method of claim 1, wherein the compound has the structure:



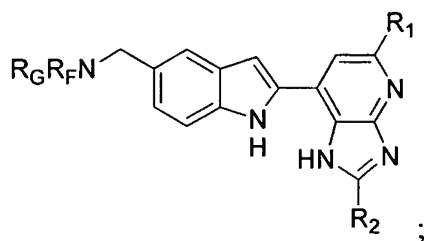
wherein R<sub>3a</sub> and R<sub>3b</sub> are each independently hydrogen, halogen, cyano, or an aliphatic, heteroaliphatic, aryl or heteroaryl moiety, or a group -G-R<sub>C</sub>, wherein G is absent, -CH<sub>2</sub>-, -NR<sub>D</sub>-, -O-, or (C=O), and wherein R<sub>C</sub> is hydrogen, -NR<sub>F</sub>R<sub>G</sub>, -OR<sub>F</sub>, -SR<sub>F</sub>, or an aliphatic, heteroaliphatic, aryl, or heteroaryl moiety, wherein R<sub>D</sub>, R<sub>F</sub> and R<sub>G</sub> are each independently hydrogen, -NR<sub>x</sub>R<sub>y</sub>, an aliphatic, cycloaliphatic, heteroaliphatic, cycloheteroaliphatic, aryl, or heteroaryl moiety, an acyl moiety substituted with an aliphatic, heteroaliphatic, aryl or heteroaryl moiety, or wherein R<sub>D</sub> and R<sub>C</sub> or R<sub>F</sub> and R<sub>G</sub> taken together are a 3-, 4-, 5-, 6-, 7- or 8-membered substituted or unsubstituted cycloaliphatic or cycloheteroaliphatic moiety; wherein each occurrence of R<sub>x</sub> and R<sub>y</sub> is independently hydrogen, an aliphatic, cycloaliphatic, heteroaliphatic, cycloheteroaliphatic, aryl, or heteroaryl moiety, an acyl moiety substituted with an aliphatic, heteroaliphatic, aryl or heteroaryl moiety, or wherein R<sub>x</sub> and R<sub>y</sub> taken together are a 4-, 5- or 6-membered substituted or unsubstituted, saturated or unsaturated cycloaliphatic or cycloheteroaliphatic moiety.

3. The method of claim 1, wherein the compound has the structure:



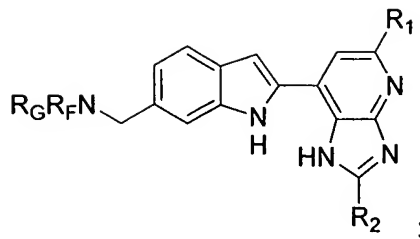
wherein  $R_{3a}$  and  $R_{3b}$  are each independently hydrogen, halogen, cyano, or an aliphatic, heteroaliphatic, aryl or heteroaryl moiety, or a group  $-G-R_C$ , wherein  $G$  is absent,  $-\text{CH}_2-$ ,  $-\text{NR}_D-$ ,  $-\text{O}-$ , or  $(\text{C}=\text{O})$ , and wherein  $R_C$  is hydrogen,  $-\text{NR}_F R_G$ ,  $-\text{OR}_F$ ,  $-\text{SR}_F$ , or an aliphatic, heteroaliphatic, aryl, or heteroaryl moiety, wherein  $R_D$ ,  $R_F$  and  $R_G$  are each independently hydrogen,  $-\text{NR}_x R_y$ , an aliphatic, cycloaliphatic, heteroaliphatic, cycloheteroaliphatic, aryl, or heteroaryl moiety, an acyl moiety substituted with an aliphatic, heteroaliphatic, aryl or heteroaryl moiety, or wherein  $R_D$  and  $R_C$  or  $R_F$  and  $R_G$  taken together are a 3-, 4-, 5-, 6-, 7- or 8-membered substituted or unsubstituted cycloaliphatic or cycloheteroaliphatic moiety; wherein each occurrence of  $R_x$  and  $R_y$  is independently hydrogen, an aliphatic, cycloaliphatic, heteroaliphatic, cycloheteroaliphatic, aryl, or heteroaryl moiety, an acyl moiety substituted with an aliphatic, heteroaliphatic, aryl or heteroaryl moiety, or wherein  $R_x$  and  $R_y$  taken together are a 4-, 5- or 6-membered substituted or unsubstituted, saturated or unsaturated cycloaliphatic or cycloheteroaliphatic moiety.

4. The method of claim 1, wherein the compound has the structure:



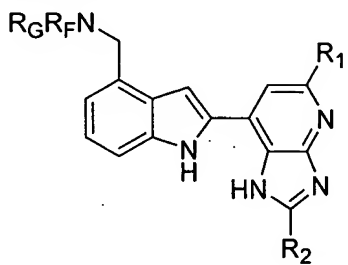
wherein  $R_1$ ,  $R_2$ ,  $R_F$  and  $R_G$  are as defined in claim 1.

5. The method of claim 1, wherein the compound has the structure:



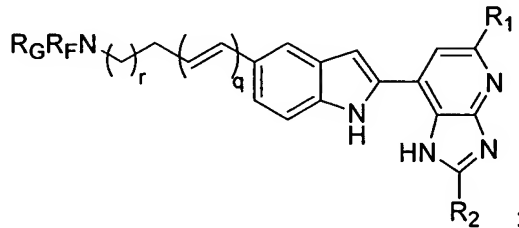
wherein  $R_1$ ,  $R_2$ ,  $R_F$  and  $R_G$  are as defined in claim 1.

6. The method of claim 1, wherein the compound has the structure:



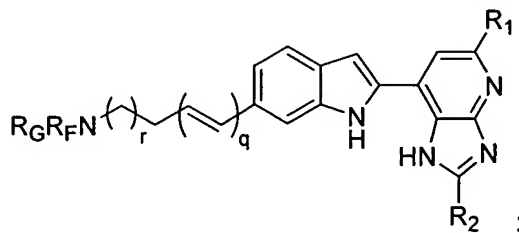
wherein  $R_1$ ,  $R_2$ ,  $R_F$  and  $R_G$  are as defined in claim 1.

7. The method of claim 1, wherein the compound has the structure:



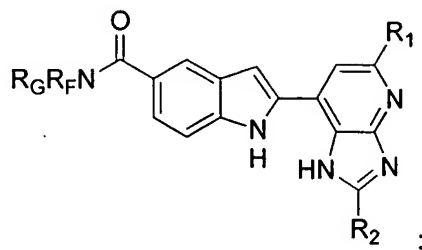
wherein  $q$  and  $r$  are each independently 0 or 1; and  $R_1$ ,  $R_2$ ,  $R_F$  and  $R_G$  are as defined in claim 1.

8. The method of claim 1, wherein the compound has the structure:



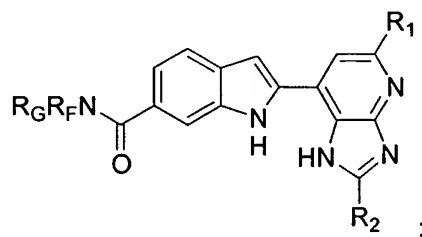
wherein  $q$  and  $r$  are each independently 0 or 1; and  $R_1$ ,  $R_2$ ,  $R_F$  and  $R_G$  are as defined in claim 1.

9. The method of claim 1, wherein the compound has the structure:



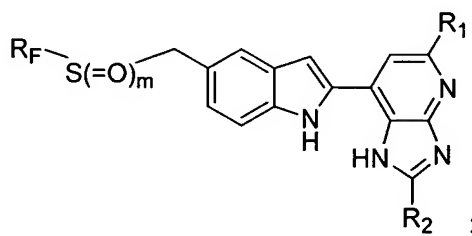
wherein  $\text{R}_1$ ,  $\text{R}_2$ ,  $\text{R}_\text{F}$  and  $\text{R}_\text{G}$  are as defined in claim 1.

10. The method of claim 1, wherein the compound has the structure:



wherein  $\text{R}_1$ ,  $\text{R}_2$ ,  $\text{R}_\text{F}$  and  $\text{R}_\text{G}$  are as defined in claim 1.

11. The method of claim 1, wherein the compound has the structure:

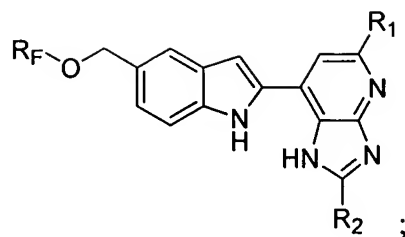


wherein  $\text{R}_1$  and  $\text{R}_2$  are as defined in claim 1;

$m$  is 0, 1 or 2; and

$\text{R}_\text{F}$  is an aliphatic, cycloaliphatic, heteroaliphatic, cycloheteroaliphatic, aryl, or heteroaryl moiety.

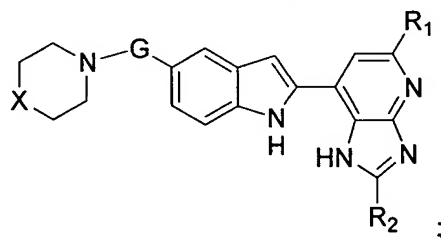
12. The method of claim 1, wherein the compound has the structure:



wherein  $R_1$  and  $R_2$  are as defined in claim 1; and

$R_F$  is hydrogen, a protective group or an aliphatic, cycloaliphatic, heteroaliphatic, cycloheteroaliphatic, aryl, or heteroaryl moiety.

13. The method of claim 1, wherein the compound has the structure:

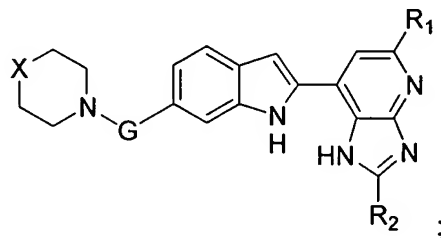


wherein  $R_1$  and  $R_2$  are as defined in claim 1;

G is  $\text{CH}_2$  or  $-(\text{C}=\text{O})$ ; and

X is O, S, C=O, S=O,  $\text{C}=\text{CR}_4\text{R}_5$ ,  $\text{NR}_4$ , or  $\text{CR}_4\text{R}_5$ ; wherein each occurrence of  $R_4$  and  $R_5$  is independently hydrogen, hydroxyl, halogen, cyano an aliphatic, heteroaliphatic, aryl, or heteroaryl moiety, or is an acyl moiety substituted with an aliphatic, heteroaliphatic, aryl or heteroaryl moiety.

14. The method of claim 1, wherein the compound has the structure:



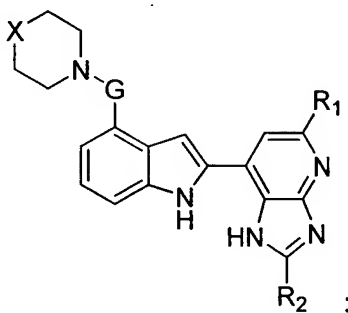
wherein  $R_1$  and  $R_2$  are as defined in claim 1;

G is  $\text{CH}_2$  or  $-(\text{C}=\text{O})$ ; and

X is O, S, C=O, S=O,  $\text{C}=\text{CR}_4\text{R}_5$ ,  $\text{NR}_4$ , or  $\text{CR}_4\text{R}_5$ ; wherein each occurrence of  $R_4$  and  $R_5$  is independently hydrogen, hydroxyl, halogen, cyano an aliphatic, heteroaliphatic, aryl, or

heteroaryl moiety, or is an acyl moiety substituted with an aliphatic, heteroaliphatic, aryl or heteroaryl moiety.

15. The method of claim 1, wherein the compound has the structure:

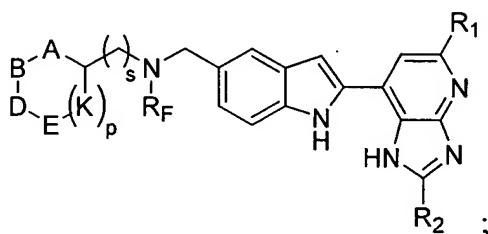


wherein  $R_1$  and  $R_2$  are as defined in claim 1;

G is  $\text{CH}_2$  or  $-(\text{C}=\text{O})$ ; and

X is O, S,  $\text{C}=\text{O}$ ,  $\text{S}=\text{O}$ ,  $\text{C}=\text{CR}_4\text{R}_5$ ,  $\text{NR}_4$ , or  $\text{CR}_4\text{R}_5$ ; wherein each occurrence of  $R_4$  and  $R_5$  is independently hydrogen, hydroxyl, halogen, cyano an aliphatic, heteroaliphatic, aryl, or heteroaryl moiety, or is an acyl moiety substituted with an aliphatic, heteroaliphatic, aryl or heteroaryl moiety.

16. The method of claim 1, wherein the compound has the structure:



wherein  $R_1$  and  $R_2$  are as defined in claim 1;

p is an integer from 0-3;

s is an integer from 0-4;

A, B, D, E and each occurrence of K are independently absent, O, S,  $-\text{C}=\text{O}$ ,  $-\text{S}=\text{O}$ ,  $-\text{C}=\text{CR}_4\text{R}_5$ ,  $-\text{NR}_4$ , or  $-\text{CR}_4\text{R}_5$ , wherein each occurrence of  $R_4$  and  $R_5$  is independently hydrogen, hydroxyl, halogen, cyano,  $-\text{OR}_x$ ,  $-\text{SR}_x$ ,  $-\text{NR}_x\text{R}_y$ , an aliphatic, heteroaliphatic, aryl, or heteroaryl moiety, or is an acyl moiety substituted with an aliphatic, heteroaliphatic, aryl or heteroaryl

moiety; and wherein A and B, B and D, D and E, E and K and any two adjacent K groups may be linked by a single or double bond as valency permits; wherein each occurrence of  $R_x$  and  $R_y$  is independently hydrogen, a protecting group, or an aliphatic, heteroaliphatic, aryl, heteroaryl, aliphaticaryl, heteroaliphatic aryl, aliphaticheteroaryl or heteroaliphaticheteroaryl moiety.

17. The method of any one of claims 1-16, wherein in the compound  $R_1$  is  $NH_2$ .
18. The method of any one of claims 1-16, wherein in the compound  $R_1$  is hydrogen.
19. The method of any one of claims 1-16, wherein in the compound  $R_2$  is  $NH_2$ , OH,  $C_1-C_6$  alkyl or  $C_1-C_6$  alkenyl, said alkyl and alkenyl groups optionally substituted with halogen or hydroxyl.
20. The method of any one of claims 1-16, wherein in the compound  $R_2$  is  $C_1-C_2$  alkyl.
21. The method of any one of claims 1-16, wherein in the compound  $R_2$  is methyl.
22. The method of any one of claims 1-16, wherein in the compound  $R_2$  is hydrogen.
23. The method of any one of claims 4-10, wherein in the compound one of  $R_F$  or  $R_G$  is hydrogen or lower alkyl; and the other is an alkyl, heteroalkyl, aryl, heteroaryl, alkylaryl or alkylheteroaryl, optionally independently substituted for each occurrence with one or more of halogen, alkoxy, thioalkyl, or substituted or unsubstituted alkyl, heteroalkyl, aryl, or heteroaryl, or wherein  $R_F$  and  $R_G$  taken together are a 3-, 4-, 5-, 6-, 7- or 8-membered substituted or unsubstituted, saturated or unsaturated cyclic or heterocyclic moiety.
24. The method of any one of claims 4-10, wherein in the compound one of  $R_F$  or  $R_G$  is hydrogen or lower alkyl; and the other is an aryl, heteroaryl, alkylaryl or alkylheteroaryl moiety, optionally independently substituted for each occurrence with one or more of halogen, alkoxy, thioalkyl, or substituted or unsubstituted alkyl, heteroalkyl, aryl, or heteroaryl, or wherein  $R_F$  and



R<sub>G</sub> taken together are a 3-, 4-, 5-, 6-, 7- or 8-membered substituted or unsubstituted, saturated or unsaturated cyclic or heterocyclic moiety.

25. The method of claim 24, wherein in the compound one of R<sub>F</sub> or R<sub>G</sub> is hydrogen or lower alkyl; and the other is phenyl, pyridyl, (alkyl)phenyl, or (alkyl)pyridyl, optionally substituted with one or more occurrences of halogen, trifluoromethoxy, methoxy, trifluoromethyl, methylthio, or substituted or unsubstituted lower alkyl, lower heteroalkyl, aryl or heteroaryl.

26. The method of any one of claims 4-10, wherein in the compound one of R<sub>F</sub> or R<sub>G</sub> is hydrogen or lower alkyl; and the other is a cyclic or acyclic, linear or branched, saturated or unsaturated aliphatic moiety optionally substituted with one or more of substituted or unsubstituted aryl, heteroaryl, amide, alkoxy, hydroxyl, thioalkyl, thiol, acyl or amino.

27. The method of claim 11, wherein in the compound R<sub>F</sub> is an alkyl, cycloalkyl, heteroalkyl, cycloheteroalkyl, aryl, heteroaryl, alkylaryl or alkylheteroaryl, optionally independently substituted for each occurrence with one or more of halogen, alkoxy, thioalkyl, or substituted or unsubstituted alkyl, heteroalkyl, aryl, or heteroaryl.

28. The method of claim 12, wherein in the compound R<sub>F</sub> is hydrogen, a protecting group, or an alkyl, cycloalkyl, heteroalkyl, cycloheteroalkyl, aryl, heteroaryl, alkylaryl or alkylheteroaryl, optionally independently substituted for each occurrence with one or more of halogen, alkoxy, thioalkyl, or substituted or unsubstituted alkyl, heteroalkyl, aryl, or heteroaryl.